



VOLUME 20 NUMBER 1 MISSOURI DEPARTMENT OF NATURAL RESOURCES

SPRING 2013

Well Installation Board News

The Missouri Well Installation Board held its quarterly meeting Nov. 5, 2012, at the Missouri Department of Natural Resources facility in Rolla. The Board reviewed and voted to deny an appeal to waive the apprenticeship requirement. They also received updates about enforcement cases, rulemaking actions and section activities.

The next quarterly meeting is scheduled for Monday, Feb. 18, 2013, at 10 a.m. The meeting will be held in conjunction with the Missouri Water Well Association's annual conference, to be held at the Country Club Hotel in Lake Ozark. A subsequent meeting is scheduled for 10 a.m., Friday, May 10, 2013, at the Department of Natural Resources' annex conference room in Rolla, Mo.

Rule Updates

Currently, four Missouri Well Construction Rule amendments are moving through the rulemaking process. Draft rules are available on the division's webpage at dnr.mo.gov/geology/geosrv/geo-rules-in-dev.htm.

The proposed rulemaking regarding Disciplinary Action and Appeal Procedures (10 CSR 23-1.075), is awaiting approval from the department before filing with the Secretary of State's Office. The proposed language clarifies the procedure for any person who is affected by a decision made by the division to file an appeal with the Well Installation Board. It is anticipated that the proposal will be filed with the Secretary of State's Office and printed in the Missouri Register in spring or early summer 2013.

Stakeholder meetings were held in December 2012 to receive comments on the draft proposed heat pump rulemaking (10 CSR 23-5.010 – 10 CSR 23-5.080). Meetings were well attended and staff appreciated stakeholder participation. Staff are working to revise the draft based on comments received.

The Continuing Education program rulemaking is in the beginning stages. The proposal will require all permittees to obtain continuing education credits to renew their permit. More information will be provided regarding this topic in the future.

The Public Well Permit Requirement rulemaking is also in the beginning stages. The proposal will require contractors to obtain a "public well permit" to drill or install pumps in public wells. More information will be provided regarding this topic in the future.

Questions regarding these rulemakings or the rulemaking process should be directed to Sheri Fry.

Justin Davis Joins the Section

Justin Davis was selected as the Investigation and Remediation Unit Chief in the Wellhead Protection Section. Justin officially began duties October 15, 2012, and brings with him experience in groundwater hydrology and environmental drilling. Justin is a Registered Geologist in Missouri and holds a Bachelor and Master of Science in geology from Missouri University of Science and Technology (formerly University of Missouri Rolla). Justin comes to us from the Division of Geology and Land Survey's Industrial Minerals Unit, where he served for four years as a geologist assisting Missouri's mineral industry. Prior to working for the division, Justin spent seven years with the U.S. Geological Survey Missouri Water Science Center where he gained extensive experience in groundwater and surface water hydrology. During his time with the USGS, Justin was involved in several environmental drilling projects.

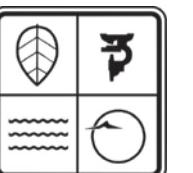


Type III Neat Cement for Monitoring Well Applications

Missouri Well Construction Rules (MWCR) stipulate that Type III neat cement may only be used in monitoring wells with metallic casing or riser pipe if prior approval is obtained from the division [10 CSR 23-4.060 (9) (C) (1)].

Type III cement is used for shorter set up times, but the faster set up comes with a drawback – a higher heat of hydration. The chemical reaction that occurs when the cement is mixed is exothermic, meaning that it generates heat. This release of heat can damage PVC or ABS plastic casing or riser pipe, which creates a conduit for contamination to enter the subsurface. For this reason, prior approval is mandated by the MWCR.

However, upon further review, the division has concluded that this procedure is highly inefficient in practice. Therefore, as of September 18, 2012, the division is providing blanket approval for the use of Type III cement for monitoring well applications where metallic casing or riser pipe is used. Please note that Type III cement cannot be used with PVC or ABS plastic casing or riser pipe. Further, no type of cement may be used in monitoring wells unless additives such as bentonite are used to prevent shrinkage. Please refer to the MWCR or call Wellhead Protection staff for more information.



Large Diameter Push-probe Technology

Monitoring well construction rules (Chapter 4, Missouri Well Construction Rules) were updated in 2011 to reflect changes in monitoring well installation technology; innovations such as direct push technology, soil vapor implants, and lysimeter installation were addressed. The revised rules became effective July 30, 2011. The minimum nominal riser diameter for a direct push well changed to 0.75 inches. The minimum borehole diameter for installing a 0.75 or 1.0 inch screen and riser was changed to 3.25 inches. These revisions were discussed at stakeholder meetings with contractors and are based on new technology considered industry standard.

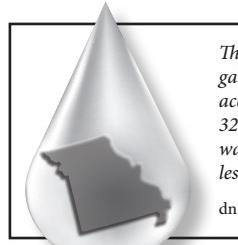
The introduction of another generation of monitoring well drilling rigs allows contractors to use direct push for installing larger diameter boreholes. Some of these rigs are multifunction, capable of direct push, rotary, and auger drilling as well as coring and drop hammer sampling. There are now push probe rigs with 60,000 to 80,000 lb. pull back and 50,000 to 60,000 lb. down force. Some of these rigs are capable of 5,000 to 6,000 ft-lbs of torque and rotational speeds of 100 to 200 rpm. With the introduction of such rigs, 4.5-inch diameter direct push tooling is now possible. As a result, questions have arisen regarding the maximum diameter screen and riser that can be installed in a borehole diameter in excess of 3.25 inches using direct push technology.

Regardless of the other functions for which the rig may be capable, if the well is installed using auger, rotary or cable tool technology, the minimum riser and screen diameter is 2.0-inch nominal. The minimum borehole diameter must be at

Connie Edwards Selected as Geological Survey Program Secretary



Connie Edwards recently accepted a position as the Geological Survey Program Secretary, within the Division of Geology and Land Survey. She began her new duties October 16, 2012, which leaves the Processing Unit Chief in the Wellhead Protection Section vacant. Upon her departure, Connie said, "It has been a great pleasure to work with the Wellhead staff and drilling industry during my tenure in the Wellhead Protection Section. I appreciate the opportunity to have worked with you and wish you all the very best." Connie will continue to serve as Secretary for the Well Installation Board.

The average family's indoor water usage is about 50 gallons of water per person per day. Flushing the toilet accounts for about 42 percent of the total, bathing is 32 percent, and laundry is 14 percent. The amount of water that is used for drinking or cooking is probably less than 4 percent of the total.
dnr.mo.gov/energy/residential/waterusage.htm

least 4 inches larger in diameter than the outside diameter of the screen and riser being installed. As long as the borehole diameter is at least 4 inches larger than the outside diameter of the riser and screen, Missouri Well Construction Rules establish no maximum size. An exemption remains in effect when using an industry standard 6.25-inch internal diameter hollow stem auger for the installation of a 2-inch nominal diameter screen and riser, using a 6-inch diameter borehole below auger depth. The exemption when using an industry standard 8.25-inch internal diameter hollow stem auger for the installation of a 4-inch nominal diameter screen and riser, using an 8-inch diameter borehole below auger depth, is also still in effect.

When using direct push technology to install the well, the annular space created when using a 3.25-inch diameter borehole and 1-inch nominal diameter (schedule 40) riser and screen would be 0.96 inches. This annular space is the minimum allowed by the rules for direct push technology. Contractors using a 4.5-inch tooling could install a 2-inch nominal diameter (schedule 40) screen and riser and still meet the minimum annular space requirement. For example:

4.5 inches - 2.375 inches (the outside diameter of a 2-inch, schedule 40 riser) = 2.125 inches.

2.125 inches divided by 2 equals an annular space of 1.06 inches.

Questions regarding the monitoring well construction rules should be directed to Wellhead Protection staff at 573-368-2165.

Unique Geographic Location Required for Monitoring Wells

Please accept this friendly reminder that a unique geographic location is required for each monitoring well submitted for certification. Missouri Well Construction Rule 10 CSR 23-4.020(5) states that the location accuracy shall be at least one (1) place after the seconds decimal point in this format: latitude 38°59'59.9"N, longitude 94°01'01.0"W. Submitting accurate location information will help maintain a reliable database and will ensure Missouri's groundwater resources are better protected.

Occasionally, monitoring wells are destroyed or covered over during construction operations. Without accurate location information, contractors responsible for plugging them are unable to find them and the wells remain open. This leaves a potential conduit for groundwater contamination from the surface.

In the past, some contractors have submitted a single GPS location for multiple wells on a site. While it may be permissible in regard to temporary monitoring wells that are plugged within 30 days, this is not an acceptable practice for reporting permanent monitoring wells. Failure to submit a unique geographic location for each monitoring well record will result in its return for correction and a delay in the certification process.

Welcome Contractors

The following individuals are now part of the Missouri Department of Natural Resources' permitted contractor community:

Arcadis – Larry Benolkin and Laura Madsen
Boessen Underground – Brian Stegeman
DM Heating & Cooling – Edward Wieman
Faszold Service – Michael Faszold and Michael Faszold II
Geotherm Drilling – Wade Hanks
Hauser Mechanical – Edward Wieman
Natural Resource Technology – Troy Clausen and Jacob Walczak
Phoenix Coal Co. – Robert Collins
Terracon – Samantha Keeran

Welcome Apprentice Contractors

The following individuals are now part of the Missouri Department of Natural Resources' permitted apprentice contractor community:

Douglas Pump Service – Kyle Shrader
Hewitt-Messenger Well Drilling – Brent George
Larsen & Associates – Steve Woodstock
PSA Environmental – John (Mitch) Hughes
Vironex – T J Haley and Sean Gardner
Welker Pump Service – Rodney Cook



Contractor and Apprentice Well and Pump Installation Testing Schedule

The following testing dates are scheduled and begin at 9 a.m. at the Division of Geology and Land Survey, 111 Fairgrounds Road, Rolla.

January 16, 2013	July 17, 2013
February 13, 2013	August 14, 2013
March 13, 2013	September 18, 2013
April 17, 2013	October 16, 2013
May 15, 2013	November 13, 2013
June 12, 2013	December 18, 2013

Testing dates may be modified if necessary. Questions concerning this schedule or testing can be answered by calling 573-368-2450. People with disabilities who may require special services should contact Jeannie Hoyle at the number above.

A photo ID is required in order to take the test. If applying for a non-restricted permit please bring a global positioning unit (GPS) and operating manual to the test site. GPS units should be programmed to read in degrees, minutes, and seconds in accordance with 10 CSR 23-3.060(5).

Farewell

The following individuals are no longer permitted to operate as contractors according to the Water Well Drillers Act and Well Construction Regulations:

Conways Drilling – Kendall Conway
Kennedy/Jenks Consultants – Julie Westhoff
Layne-Arkansas – Jerry Dawes
Terracon – Mark Milward

Regulations Governing Oil, Gas and Water Wells

Missouri oil production occurs mainly along the state line from Nevada in Vernon County to Jackson County near Kansas City, with some additional oil production north of Kansas City in Atchison County. On the eastern side of the state, limited oil production occurs in St. Charles County north of St. Louis.



For the most part, Missouri's oil is "heavy" and does not flow under pressure like that of a typical oil well in Texas. The oil must be heated using steam or pushed by water in order to extract the valuable resource.

Water flood and steam operations demand a large volume of water to produce oil on many leases in the state. The majority of the operators use a municipal district water supply to produce high-quality steam with low dissolved solids. A few operators will use the groundwater supply and treat the water to obtain a high degree of quality before converting to steam.

Aquifers associated with oil and natural gas pools tend to have high sulfur concentrations and high total dissolved solids. This combination results in poor water quality especially for potable uses. Although the water quality is poor in oil production areas, it is essential that all groundwater resources be protected.

Water wells drilled in all areas of the state must conform to Missouri Well Construction Rules, including water wells drilled into potable aquifers to aid in the production of oil or natural gas.

The rules require all water wells be drilled by a permitted contractor who is licensed in the state. Wells used to produce oil and natural gas or wells drilled in connection with the production of oil and gas (such as injection wells) are exempt under the water well rules. Therefore, oil and gas operators need to be aware that drilling contractors who drill oil and gas wells may not drill water wells unless they hold a valid permit from the Wellhead Protection Section.

Charitable or Benevolent Organization Public Water Systems

The Missouri Legislature passed House Bill 250 in 2011, amending Chapter 640 RSMo. Section 640.116 RSMo, effective August 2011, addresses regulations regarding well construction requirements for charitable and benevolent organizations. Previously, a charitable or benevolent organization (COBO) such as a small church was required to construct a transient, non-community public water supply well.

The new law provides an exemption allowing wells to be constructed to multi-family well standards if the COBO meets certain requirements. The exemption only applies while the COBO meets all of the requirements. If for any reason the organization no longer meets all of the criteria, it will be required to drill a new public well.

In order to qualify for the exemption, a COBO must meet ALL of the following requirements:

- The organization must be charitable or benevolent.
- The COBO cannot serve 100 or more people 60 or more days of the year.
- The COBO cannot serve a school or daycare facility.
- The well cannot be connected to any buildings not owned by the COBO.

A new well certification form for these types of wells is available. The owner or responsible party must sign the form, attesting that their organization meets the exemption requirements.

This law applies only to the well construction standards. These wells will still be considered part of public water systems. Prior to serving water to the public, the organization must obtain a "Permit to Dispense" from the department's Public Drinking Water Branch. The well will be sampled according to Safe Drinking Water regulations, Sections 640.100 - 640.140 RSMo. If a system has three or more violations of the total coliform maximum contaminant level (MCL) in a 12-month period or one acute violation of the MCL, the system's owner must provide an alternative source of water and one of the following:

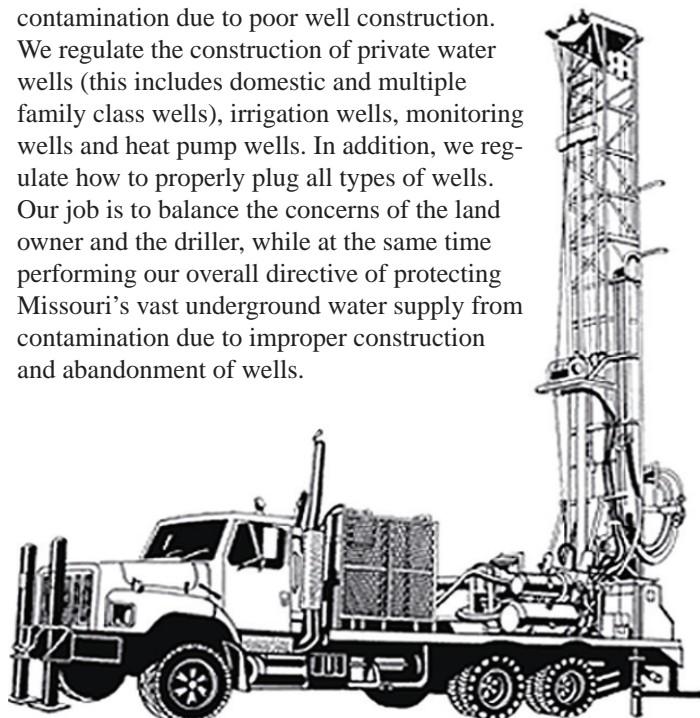
- Eliminate the source of the contamination.
- Provide treatment that reliably achieves at least 99.99 percent treatment of the contaminant.

Prior to constructing a COBO well, please contact the appropriate Regional Office to discuss the system in question. No site survey is required if the well qualifies for the exemption, and a staff member is not required to witness the grouting of the casing.

Questions about this policy or about multi-family well construction requirements should be directed to staff by calling 573-368-2165. Questions about water system sampling or permits to dispense water should be directed to the Public Drinking Water Branch at 573-751-5331.

Wellhead Protection Section

We are here to ensure any new well drilled in Missouri is constructed to minimum standards as set by state regulations. This helps protect our groundwater resources from contamination due to poor well construction. We regulate the construction of private water wells (this includes domestic and multiple family class wells), irrigation wells, monitoring wells and heat pump wells. In addition, we regulate how to properly plug all types of wells. Our job is to balance the concerns of the land owner and the driller, while at the same time performing our overall directive of protecting Missouri's vast underground water supply from contamination due to improper construction and abandonment of wells.



Wellhead Protection Section Staff

Wellhead Protection Section: 573-368-2165.

Website: dnr.mo.gov/geology/geosrv/wellhd/job.htm

Well Online Services: dnr.mo.gov/mowells/

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Rulemaking Process 101

The rulemaking process is a term often referred to by staff during Well Installation Board meetings, stakeholder meetings, in *The Connection* newsletter and in general conversation. This term refers to the process a proposed rulemaking makes its way through the Board, the department, and the Secretary of State's Office.

A proposed rule can be an amendment, a rescission, or a new rule. The first step in the rulemaking process is to bring the proposal to the Board for approval. If approved by the Board, staff forwards the proposal to the division director and department legal counsel for review.

After review by legal counsel, staff will prepare a draft rule that will be discussed during stakeholder meetings. The purpose of these meetings is to receive comments from stakeholders (people or entities having a stake in the outcome) and other interested parties. This is the optimal time for voicing comments and concerns regarding the proposed rulemaking.

Comments are taken to the Board for consideration and approval or rejection. If approved, the proposed rule is ready to



begin the formal rulemaking process, which includes filing the proposed rule with the Office of Administration, the Joint Committee on Administrative Rules, the Small Business Regulatory Fairness Board and the Secretary of State's Office.

The formal comment period begins when the proposed rule is published in the Missouri Register. A public hearing generally is scheduled no sooner than thirty (30) days after publication. Staff will take all comments made during the public hearing to the Board for review. All comments received during the formal comment period must be responded to for publication in the Missouri Register with the final Order of Rulemaking. After publication, the rule is published in the Code of State Regulations and generally will be effective within thirty (30) days of that date.

This article is a short synopsis of the rulemaking process and is intended to emphasize the opportunity for stakeholders to comment on a proposed rulemaking. Questions regarding this process should be directed to Wellhead Protection Section staff by calling 573-368-2165.

Web Services Growing in Popularity

Advancing technology has enabled the department to develop a number of services and tools that afford staff and contractors the ability to deliver and receive information online. Anyone who has not checked into these services is encouraged to do so.

The Well Online Form Submittal (WOLFS) system is available for use by restricted or non-restricted monitoring well contractors to electronically submit monitoring well certification and registration forms, and pay associated fees. This includes temporary monitoring wells such as soil borings. The WOLFS system will verify that the well construction or plugging meets Missouri Well Construction Rules requirements. Records submitted using WOLFS will be certified or registered immediately upon payment. WIMS is available on this website: dnr.mo.gov/mowells/

Online discovery of well records is available through the Well Information Management System (WIMS). WIMS allows the public to search for well records that were completed after November 1987, using various information including but not limited to: owner name, owner address, reference number, legal description and GPS location. Once the record of interest is located, it can be viewed and printed. WOLFS is also available on the website identified above.

Anyone who has an email address can subscribe to receive important updates that have been made to individual webpages using the department's GovDelivery system. GovDelivery allows website visitors to subscribe to information of specific interest to them. Individuals are able to create a personalized subscription list of content. When content changes, GovDelivery

automatically sends email or text alerts informing subscribers that the information has changed. Red envelopes have been added to many of our webpages identifying this service as being available, so look for the red envelope and subscribe.



Additionally, online subscription to *The Connection* newsletter has been available for some time. Visit dnr.mo.gov/geology/geosrv/wellhd/subscription.htm to subscribe or change contact information.

Reminder – Permit Renewal with Outstanding Violations

At permit renewal time, any outstanding violation must be resolved before a permit will be renewed pursuant to 10 CSR 23-1.105 which states, "A permit will not be renewed if the permittee has any unresolved violations pending against his or her permit, unless a schedule to remedy the violations has been approved by the Division." Please contact staff at 573-368-2165 with any questions you may have.

